A functional movement screen profile of an Australian police force

Orr, Rob Marc; Pope, Rodney R; Stierli, Michael; Hinton, Benjamin

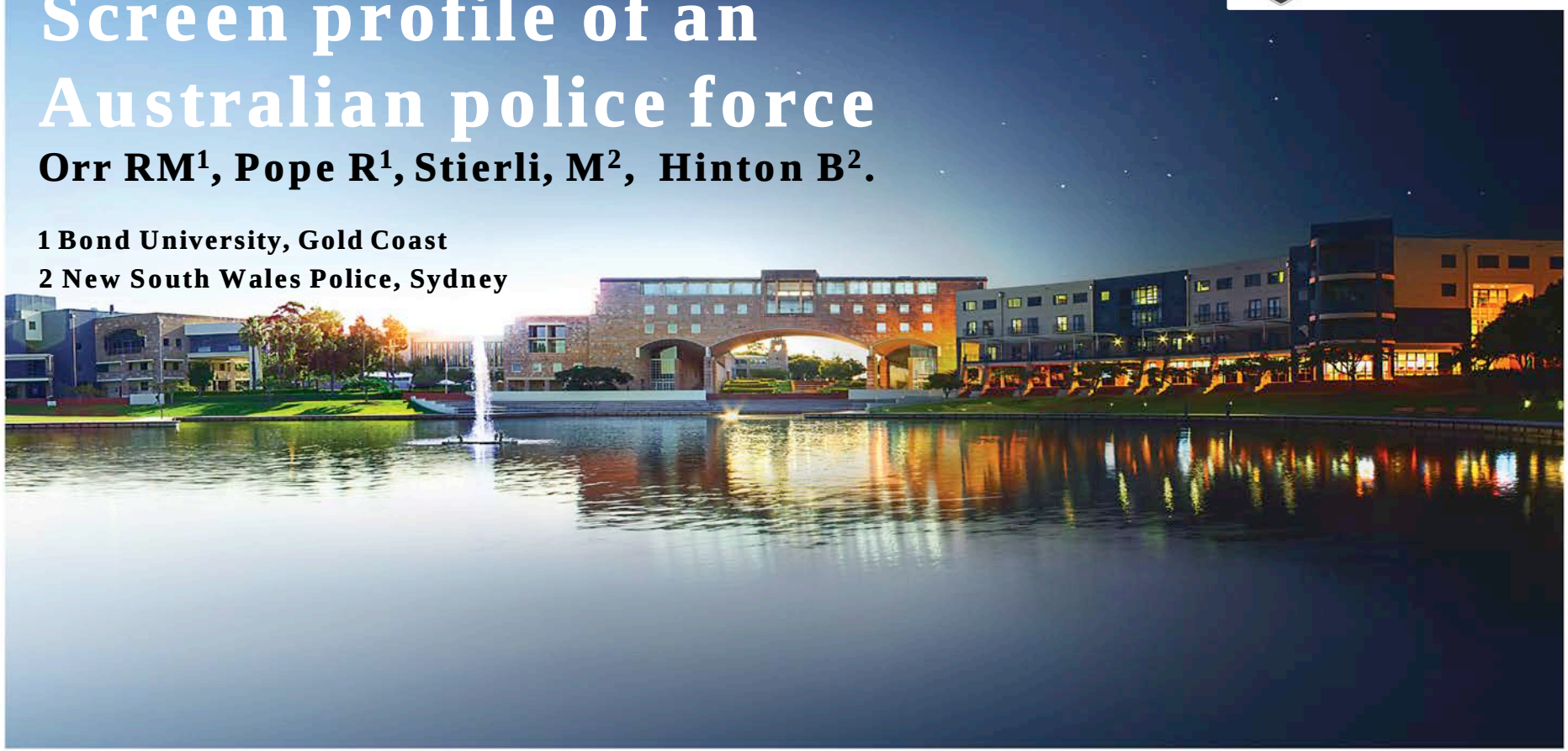
A Functional Movement Screen profile of an Australian police force

Orr RM[1], Pope R[1], Stierli, M[2], Hinton B[2].

1 Bond University, Gold Coast

2 New South Wales Police, Sydney

BOND UNIVERSITY
TACTICAL RESEARCH UNIT






Background

- Police officers are required to perform tasks that can include dynamic movements

(Blacker et al., 2013; Carlton et al., 2013)

- The results of these actions can lead to injury

(Orr & Stierli 2013)

BOND UNIVERSITY
TACTICAL RESEARCH UNIT




Background

- Poor execution of FMS elements is associated with an increased risk of musculoskeletal injury

  (Cook et al., 2006)

- The FMS tool offers an approach to injury prevention and performance prediction by identifying an individual's functional limitations and / or asymmetries

  (Gribble et al., 2013; Perry & Koehle, 2013; Kiesel., 2007; Cook et al., 2006)




Aims

- Aims:
  - To profile FMS movement patterns of NSW Police personnel
  - To determine whether differences existed between recruit and attested officers and within genders

BOND UNIVERSITY
TACTICAL RESEARCH UNIT




Participants

- A total of 1512 personnel
  - ♂n = 1155 (31.34±8.41 years): ♀ n= 357 (27.99±8.02 years)
- 823 police recruits
  - ♂n = 573 (25.78±5.57 years):♀n = 250 (25.07±5.99 years)
- 689 attested officers
  - ♂n = 582 (34.84±8.00 years):♀n = 107, (36.87±6.88 years)

BOND UNIVERSITY
TACTICAL RESEARCH UNIT

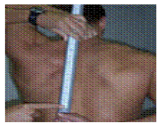



Methods

- FMS selected as the evaluation tool used to assess fundamental movement patterns
- Consists of seven movement patterns

(Cook et al., 2006)



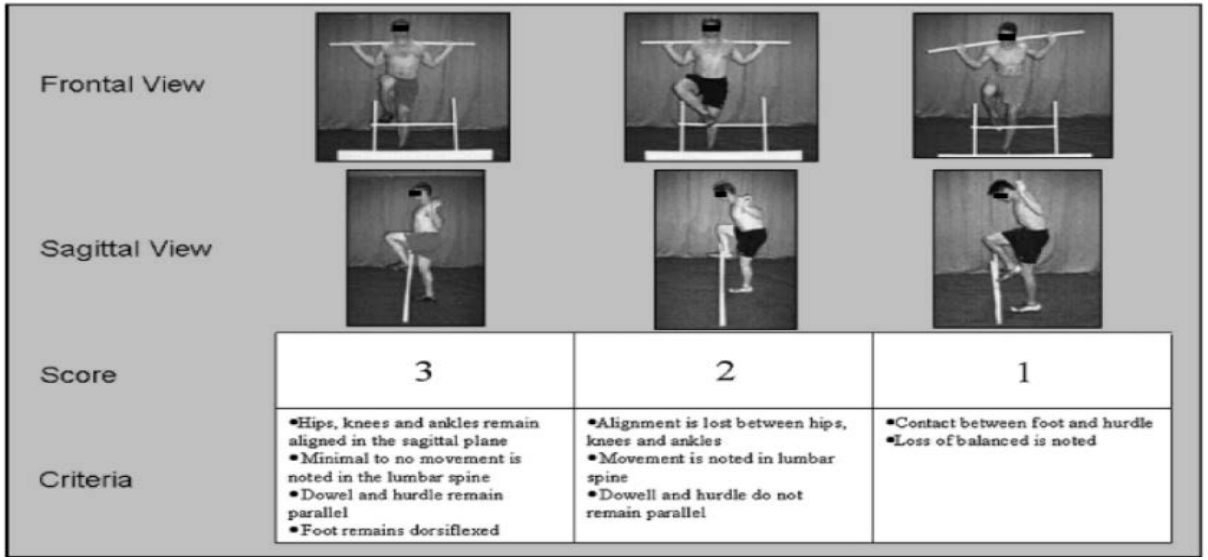




BOND UNIVERSITY
TACTICAL RESEARCH UNIT




Methods

- Scored for 0-3 for a total of 21 points



(Cook et al., 2006)

BOND UNIVERSITY
TACTICAL RESEARCH UNIT




Methods

- Inclusion criteria were:
  - a) the participant completed all aspects of the FMS; and
  - b) the police recruit participants had not attempted the police training previously
- FMS completed at commencement of training for recruits and voluntary basis for officers
- Assessors were NSW Police PTI trained in FMS




Methods

- Mann-Whitney Tests were performed to investigate differences in scoring distributions across qualification (trainees and attested officers) and gender.
- ANCOVA and subsequent independent t-tests with a Bonferroni correction to examine differences between pairs of groups
- Alpha was set at 0.05 *a priori*




Results

- Significantly higher mean FMS scores were found
  - recruits (15.23±2.01) v. attested officers (14.57±2.96; p<.001)
  - females (15.24±2.35) v. males (14.84±2.55; p=.008).
- A FMS score of ≤14 points, predictive of higher injury risk, was observed in
  - 43% of male police officers & 41% of female officers
  - 36% of male recruits & 33% of female recruits.

BOND UNIVERSITY
TACTICAL RESEARCH UNIT




Results

- An ANCOVA reveiled that age was a significant factor accounting for the total FMS score differences between
  - male trainees (25.78±5.57 years) when compared to male attested officers (34.84±8.00 years, $F(2,1)=17.417$, $p<.001$).
  - female trainees (25.07±5.99 years) when compared to female attested officers (36.87±6.88 years, $F(2,1)=6.196$, $p=0.013$)).

BOND UNIVERSITY
TACTICAL RESEARCH UNIT




Results

- The components of poorest performance, were
  - the hurdle step
  - rotary stability

BOND UNIVERSITY
TACTICAL RESEARCH UNIT




Discussion

- In our study, mean FMS scores (14.93±2.51) were ↓ than:
  - active duty service members (16.2±2.2) (Teyhen, et al, 2014)
  - Emergency Task Force police officers (15.1±2.1) (McGill, et al, 2013)
  - in an active younger population of between 18 and 30 years of age (15.7±1.9) (Schneiders et al., 2011)




Discussion

- In our study, mean FMS scores (14.93±2.51) were ↑ than:
  - Canadian general population (14.14±2.85) (Kiesel, et al., 2007)
  - fire fighters (13.6±1.9) (McGill, et al, 2013)
  - football players (13.3±1.9) (McGill, et al, 2013)

BOND UNIVERSITY
TACTICAL RESEARCH UNIT




Discussion

- The components of poorest performance, being the hurdle step and rotary stability, correspond to the leading sites of injury in this population, being knee and back.


(Orr & Stierli 2013)




Conclusion / Take Home Message

- The FMS is a useful outcome measure for police officers.
- FMS movements with poorest performance correspond to injuries typically sustained in a police population.
- Specific conditioning programs to improve performance in movements identified with poorer performance may reduce injuries in police officers.

BOND UNIVERSITY
TACTICAL RESEARCH UNIT




References

- Blacker, S. D., Carter, J. M., Wilkinson, D. M., Richmond, V. L., Rayson, M. P., & Peattie, M. (2013). Physiological responses of Police Officers during job simulations wearing chemical, biological, radiological and nuclear personal protective equipment. Ergonomics, 56(1), 137-147.
- Carlton, S. D., Orr, R., Stierli, M., & Carbone, P. D. (2013). The impact of load carriage on mobility and marksmanship of the tactical response officer. Journal of Australian Strength and Conditioning, 22(1), 23-27.
- Cook, G., Burton, L., & Hoogenboom, B. (2006). Pre-participation screening: The use of fundamental movements as an assessment of function–Part 1. North American journal of sports physical therapy: NAJSPT, 1(2), 62.

BOND UNIVERSITY
TACTICAL RESEARCH UNIT




References

- Gribble, P. A., Brigle, J., Pietrosimone, B. G., Pfile, K. R., & Webster, K. A. (2013). Intrarater reliability of the functional movement screen. The Journal of Strength & Conditioning Research, 27(4), 978-981.
- Kiesel, K., Plisky, P., & Butler, R. (2011). Functional movement test scores improve following a standardized off-season intervention program in professional football players. Scandinavian journal of medicine & science in sports, 21(2), 287-292.
- Kiesel, K., Plisky, P. J., & Voight, M. L. (2007). Can serious injury in professional football be predicted by a preseason functional movement screen? North American journal of sports physical therapy: NAJSPT, 2(3), 147.




References

- McGill, S., Frost, D., Lam, T., Finlay, T., Darby, K., & Andersen, J. (2013). Fitness and movement quality of emergency task force police officers: An age-grouped database with comparison to populations of emergency services personnel, athletes and the general public. International Journal of Industrial Ergonomics, 43(2), 146-153.
- Orr, R., & Stierli, M. (2013). Injuries common to tactical personnel (A multidisciplinary review). Paper presented at the 2013 Australian Strength and Conditioning Association International Conference on Applied Strength and Conditioning, Melbourne: AUST.
- Perry, F. T., & Koehle, M. S. (2013). Normative data for the functional movement screen in middle-aged adults. The Journal of Strength & Conditioning Research, 27(2), 458-462.




References

- Schneiders, A. G., Davidsson, Å., Hörman, E., & Sullivan, S. J. (2011). Functional movement screenTM normative values in a young, active population. International journal of sports physical therapy, 6(2), 75.
- Teyhen, D. S., Riebel, M. A., McArthur, D. R., Savini, M., Jones, M. J., Goffar, S. L., . . . Plisky, P. J. (2014). Normative data and the influence of age and gender on power, balance, flexibility, and functional movement in healthy service members. Military medicine, 179(4), 413-420.